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COMMISSION ON WATER RESOURCE MANAGEMENT

March 16, 2011  
Honolulu, Hawaii

Adoption of the 2009 Koolauloa Watershed Management Plan to  
Update the City and County of Honolulu's Water Use and Development Plan for  
Incorporation into the Hawaii Water Plan

SUMMARY OF REQUEST:

Staff recommends the Commission adopt the Koolauloa Watershed Management Plan (August 2009), which is an update to the City and County of Honolulu's Water Use and Development Plan.

AUTHORITY:

The State Water Code's Declaration of Policy recognizes the need for comprehensive water resources planning and establishes the Hawaii Water Plan (HWP) as the guide for developing and implementing this policy. The HWP is intended to serve as a continuing long-range guide for the Commission in executing its general powers, duties, and responsibilities assuring economic development, good municipal services, agricultural stability, and environmental protection.

The HWP currently consists of five major components (plans) identified as the: 1) Water Resource Protection Plan, 2) Water Quality Plan, 3) State Water Projects Plan, 4) Agricultural Water Use and Development Plan, and 5) County Water Use and Development Plans.

The Water Code recognizes that the HWP must be continually updated to remain useful and relevant and further specifies that "[e]ach county shall update and modify its water use and development plans as necessary to maintain consistency with its zoning and land use policies". §174C-31(q) HRS

Exhibit 1 summarizes the agencies responsible for preparing each of the components, the primary objectives and the current status of each of the HWP components.

### WATER USE AND DEVELOPMENT PLAN (WUDP)

A separate WUDP is to be prepared by each of the four counties and adopted by ordinance. The objective of the WUDPs is to set forth the allocation of water to land use in that county.

Administrative Rule §13-170-31 states that each WUDP shall include, but not be limited to:

- (1) *Status of county water and related land development including an inventory of existing water uses for domestic, municipal, and industrial users, agriculture, aquaculture, hydropower development, drainage, reuse, reclamation, recharge, and resulting problems and constraints;*
- (2) *Future land uses and related water needs; and*
- (3) *Regional plans for water developments including recommended and alternative plans, costs, adequacy of plans, and relationship to the water resource protection plan and water quality plan.*

Additional guidelines for preparing the WUDPs are provided in Administrative Rule §13-170-32:

- (1) *Each water use and development plan shall be consistent with the water resource protection plan and the water quality plan.*
- (2) *Each water use and development plan and the state water projects plan shall be consistent with the respective county land use plans and policies, including general plan and zoning as determined by each respective county.*
- (3) *Each water use and development plan shall consider a twenty year projection period for analysis purposes.*
- (4) *The water use and development plan for each county shall also be consistent with the state land use classification and policies.*
- (5) *The cost of maintaining the water use and development plan shall be borne by the counties; state water capital improvement funds appropriated to the counties shall be deemed to satisfy Article VIII, section 5 of the State Constitution.*

### OAHU WATER MANAGEMENT PLAN

The initial HWP, including all component plans, was adopted by the Commission in 1990. In compliance with the State Water Code, the City and County of Honolulu enacted the Oahu Water Management Plan (OWMP) by Ordinance No. 90-62 and codified as Chapter 30, Articles 1, 2 and 3, Revised Ordinances of Honolulu (ROH), 1990, as amended. The OWMP serves as the WUDP for the City and County of Honolulu. The OWMP consists of policies and strategies, which guide the activities of the City and County of Honolulu and advises the Commission in the areas of planning, management, water development and use and allocation of Oahu's natural water resources.

The 1990 OWMP described existing uses of water and contemplated future needs for the island of Oahu. The plan highlighted regional water problems and identified major water development projects. It also described the quality of water required for the contemplated uses. Informational needs and data gaps identified in the plan included surface water availability and use and agricultural water demand projections.

The OWMP was updated in 1992, but Commission adoption was deferred pending additional refinement of plan components.

In 1999, the Honolulu Board of Water Supply (BWS) began the integrated island-wide water planning effort to update the OWMP. However, this approach met with significant opposition by the public. One of the major public concerns centered on the need to have equal focus on resource protection, conservation, and restoration as on water use and development. Communities wanted to be active participants in a community-based planning process. The communities also wanted assurance that there were sufficient water resources within their watersheds before island-wide regional water needs were addressed.

#### STATEWIDE FRAMEWORK FOR UPDATING THE HAWAII WATER PLAN

HRS Section 174C-31(n) provides that “[t]he commission may add to the Hawaii water plan any other information, directions, or objectives it feels necessary or desirable for the guidance of the counties in the administration and enforcement of this chapter”.

In February 2000, the Commission adopted the Statewide Framework for Updating the Hawaii Water Plan (Framework). The objectives of developing and outlining a statewide framework for the Hawaii Water Plan are:

- To achieve integration of land use and water planning efforts that are undertaken by federal, state, county, and private entities so that a consistent and coordinated plan for the protection, conservation and management of our water resources is achieved;
- To recommend guidelines for the HWP update so that the plan and its component parts are useful to the Commission, other state agencies, the counties, and the general public;
- To develop a dynamic planning process that results in a "living document" for each component of the HWP which will provide county and state decision-makers with well formulated options and strategies for addressing future water resource management and development issues;
- To better define roles and responsibilities of all state and county agencies with respect to the development and updating of the HWP components;
- To describe and outline the techniques and methodologies of integrated resource planning as the basic approach that should be utilized in developing and updating the County WUDPs;
- To facilitate permitting and to identify potential critical resource areas where increased monitoring or baseline data gathering should proceed;
- To establish an overall schedule for phased updating of the HWP; and
- To outline an Implementation Plan for near-term and long-term actions.

The Framework includes the following recommended plan elements for the County WUDP update process:

- County-Specific WUDP Project Description
- Coordination with Commission on Water Resource Management
- Stakeholder and Public Involvement
- Development of Policy Objectives and Evaluation Criteria
- Description of Water System Profiles
- Identification of Resource and Facility Options
- Development and Evaluation of Strategy Options
- Implementation Plan

The Framework further recommends integration of HWP components at the county level and advocates the use of an integrated resource planning (IRP) approach. IRP is a comprehensive form of planning that encompasses least-cost analyses of resource management options, as well as a participatory decision-making process. It involves the development of water resource alternatives that take into consideration communities and environments that may be affected, the numerous institutions concerned with water resource development and protection, and the potential for competing policy goals.

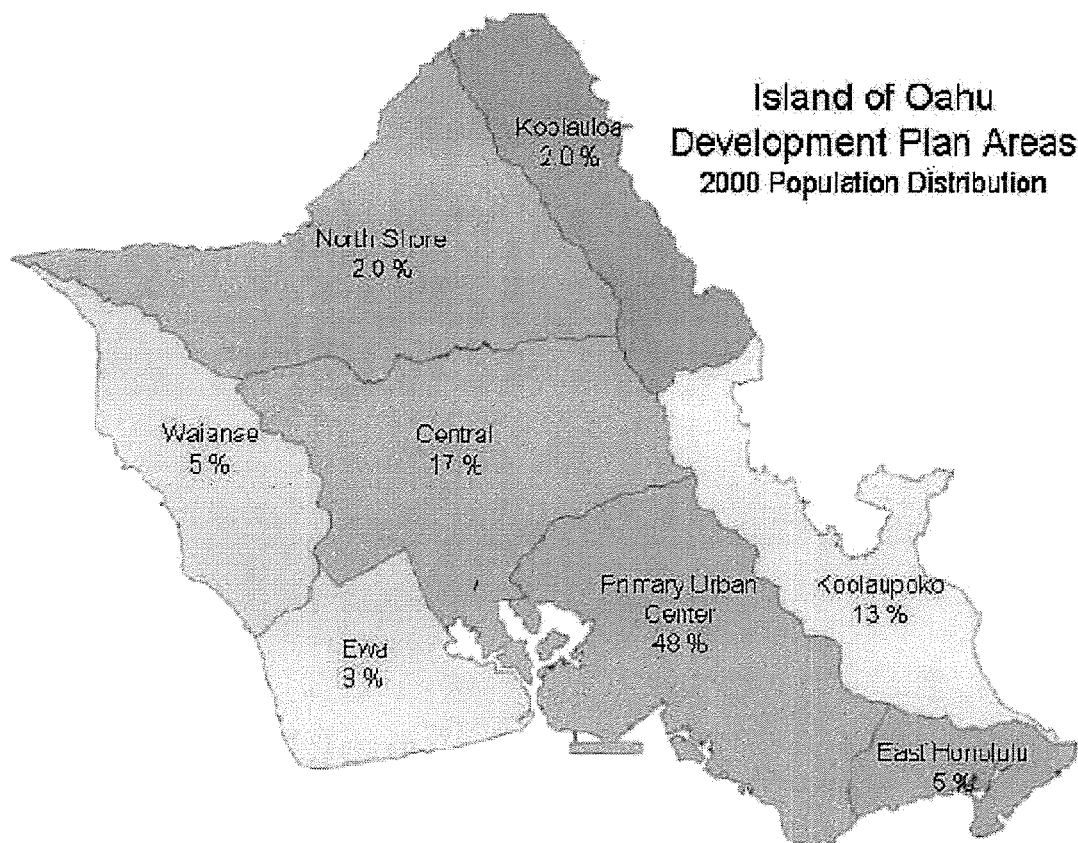
In adopting the Framework, the Commission recognized that each county faces a unique set of conditions that have an impact on the county's planning process, including:

- The nature and occurrence of water resources and existing infrastructure in the county;
- The planning issues and water use priorities the county must address;
- The financial resources available to the county; and
- The financial and organizational structure that has been established by its County Council and administration.

Thus, the Framework recognizes the need for appropriate flexibility and versatility to encourage innovation as well as to accommodate unique and county-specific concerns that may be addressed within the WUDP. In light of the above conditions, the Framework requires that each county develop a scope of work for updating its WUDP which best meets its overall objectives. The process by which these objectives are to be achieved should be set forth in a detailed project description and schedule for updating the County WUDP.

#### WUDP PROJECT DESCRIPTION

On March 17, 2004, the Commission approved the Oahu Water Management Plan Framework and Scope of Work for Waianae and Koolauloa Watershed Management Plans (OWMP Framework; Exhibit 2), which fulfills the requirement for a project description under the Framework. The OWMP Framework proposes individual planning documents referred to as regional watershed management plans, which collectively will be the updated OWMP. The regional watershed management plans will focus on resource protection, conservation and restoration as well as address current and future water needs for each of Oahu's eight land use planning regions.



Source: Koolauloa Watershed Management Plan, 2009

Under the OWMP Framework, the eight regional Watershed Management Plans (WMP) will be developed using an ahupuaa planning approach and will share the following key themes:

- Community-Based
- Environmentally Holistic
- Action-Oriented
- Aligned with State and County Water and Land Plans and Policies
- Reflective of Ahupuaa Management Principles

The OWMP Framework included proposed funding schedules and anticipated target dates for submittal to the Commission. The approval dates were based on an 18-month planning time frame and were submitted as estimates, subject to change. The following schedule and sequencing for completing the eight regional WMPs was provided in the OWMP Framework.

<b>Watershed Planning Areas</b>	<b>BWS Funding Schedule Fiscal Year</b>	<b>Target Dates for Submittal to CWRM for Plan Approval</b>
Wai'anae, Ko'olauloa	FY 2004	1 <sup>st</sup> Qtr FY 2006
North Shore, Ko'olapo'oko	FY 2006	2 <sup>nd</sup> Qtr FY 2007
South Oahu: (Ewa, Central Oahu, Primary Urban Center, East Honolulu)	FY 2007	2 <sup>nd</sup> Qtr FY 2008

The first four land use planning districts Waianae, Koolauloa, North Shore, and Koolaupoko are low growth, sustainable communities in the General Plan. BWS participated in active watershed partnerships in the Waianae and Koolauloa areas and felt these partnerships could assist in the public participation process.

The South Oahu WMPs are proposed to be funded in the same fiscal year to integrate the water resources. South Oahu plans will be done last to allow additional time for the Commission to a) complete Pearl Harbor Monitoring Working Group, b) complete BWS' 3-dimensional ground water model of the Honolulu aquifers, c) incorporate State Water Projects information, and d) revise the Agricultural Water Use and Development Plan.

The OWMP Framework proposes that each WMP will be submitted for approval as separate documents which support each respective development plan/sustainable communities land use plan.

Each of the WMPs will include an island-wide overview section. This will provide context for the regional WMPs. As each regional WMP is established, the island-wide overview section will be further refined.

#### KOOLAULOA WATERSHED MANAGEMENT PLAN:

On March 1, 2010, the City formally transmitted the Koolauloa WMP to the Commission requesting publication of the required 90-day public hearing before the Commission to facilitate public review and concurrent adoption of the WMP by the Commission and City Council. The letter noted that the plan had also been submitted to the City Council for adoption. (The Waianae WMP was also submitted under the same cover letter and is being processed concurrently by the Commission.)

On June 23, 2010, the Commission held a public hearing on the Koolauloa WMP. At the public hearing, no public testimony was received on the Koolauloa WMP.

In August 2010, the Koolauloa WMP was adopted by the City Council and was signed as City Ordinance in September 2010.

On September 23, 2010, the Koolauloa WMP was submitted to the Commission for adoption. The Commission voted to defer action to the incoming administration.

The Koolauloa WMP is a long-range plan to the year 2030 for the protection, preservation, restoration, and balanced management of ground water, surface water and related watershed resources for the Koolauloa land use planning district. As noted above, the overall goal of the plan was to formulate an environmentally holistic, community-based, and economically viable watershed management plan that will provide a balance between:

- (1) the protection, preservation, and management of Oahu's watersheds; and
- (2) sustainable groundwater and surface water use and development to serve present users and future generations.

An extensive stakeholder consultation process was employed to capture regional issues and district-specific concerns. A list of the public outreach meetings and opportunities for community consultation in Koolauloa is provided in Exhibit 3. Through community outreach and consultation,

region-specific objectives, sub-objectives, and strategies to meet these were developed (Exhibit 4). The development of these objectives, sub-objectives and strategies were facilitated through the regional approach outlined in the OWMP Framework. Extensive community involvement and detailed community concerns, values, and issues would not have been feasible through an island-wide scoping and update.

In terms of water use and development planning, the Koolauloa WMP included the following key findings:

- In 2000, the total water demand in the Koolauloa district was 26.14 million gallons per day (mgd).
- Of the 26.14 mgd total demand in 2000, potable demand accounted for 11.01 mgd, while non-potable needs were 15.13 mgd.
- Of the 11.01 mgd potable demands, 8.60 mgd was exported to the Koolaupoko and North Shore districts.
- 2000 demands were met by four types of water sources: Koolauloa Aquifer Sector pumpage, surface water, recycled water, and agricultural water savings.
- The most likely growth scenario shows Koolauloa projected 2030 demand is 32.93 mgd, 12.34 mgd of which are potable demands and 20.59 mgd are non-potable.
- The 6.79 mgd projected 2030 increase in water demand will be met primarily through increased ground water pumpage from the Koolauloa Aquifer System Area, increased use of recycled water, and increased water conservation.
- In conformance with the Sustainable Communities Plan and General Plan, the increase in demand is due to additional residential housing in Laie and Kahuku, expansion of Turtle Bay and a 60% increase in irrigated truck crops and orchards.
- Exports to Koolaupoko and North Shore will not change significantly.
- Water conservation is especially important in Koolaupoko. Because of the greater population compared to Koolauloa and the relatively larger amount of water use. There are significant opportunities for conservation.
- Future agricultural water demand is the largest unknown. If more agricultural water were needed, ground water is the largest, readily-available source.
- There is a need for additional diversification in water supply, and the development of additional non-potable sources can replace some potable water currently being used for non-potable purposes.
- Additional use of surface water will be deferred pending the establishment of instream flow standards.
- The lack of surface water use information is a significant data gap that hinders water use and development planning.

Exhibit 5 summarizes the water demand and supply options for Koolauloa.

## ISSUES/ANALYSIS

### I. Consistency with State Water Code Requirements and Recommended Framework Elements

The Koolauloa WMP meets the statutory requirements set forth in the State Water Code and sufficiently addresses the recommended elements in the Framework pertaining to the update of the County WUDPs. The envisioned outcomes, benefits, and products support the

Commission's duties and responsibilities set forth in HRS §174C-5, the requirements of the HWP described in HRS §174C-31, and the requirements for the WUDP described in the Administrative Rules.

## II. Regional WMPs versus Island-Wide WUDP

The State Water Code and Framework provide for the development of regional plans. These plans are “living documents” and must be continually updated to remain useful and relevant. This watershed-based approach is consistent with the “living document” approach that the Commission adopted for updating the HWP. The approach is consistent with ahupuaa-based management recommended in the Water Resource Protection Plan. Plans by their very nature are temporary and must be continually reviewed, refined, and updated. Any discrepancies between districts will be addressed as part of the next iterative update for the region.

Each WMP includes an island-wide overview section to provide context for the regional WMPs. As each WMP is established, the island-wide overview section will be revised. Island-wide information in the overview section and appendices include: plan goals and objectives applying the watershed-based approach to holistic resource management; plans, policies, guidelines and controls covering federal laws, State Water Code, Hawaii Water Plan, Framework, water rights, public trust doctrine, the precautionary principle, and City land use plans and ordinances; urban and agricultural forecasts by land use district; sustainable yield, permitted use and water uses by water management area; mean perennial stream flows; existing and potential ground water, surface water and alternative sources of water to meet demand; summary of adequacy of supply; uncertainties and contingencies for ground water and surface water supplies and demand forecasts; and plan implementation.

## III. Timeframe for Completion of all the WMPs

The first two regional WMPs for Koolauloa and Waianae have taken longer than expected to complete due to the delay in the update of the Water Resource Protection Plan, which re-evaluated Oahu's sustainable yields in 2008. Development of the Koolaupoko WMP, which is currently underway is proceeding much faster, and a public review draft has already been published. BWS has submitted an updated schedule for completing the WMPs (Exhibit 6). The following table lists the eight land use districts on Oahu with the revised funding schedules and revised target dates for submittal to the Commission for plan approval as of February 2011. The revised dates are estimates, based on best available information from recent experience in compiling a comprehensive watershed based plan with a significant public participation component and an extensive plan endorsement/approval process with the neighborhood boards, City Council and Commission. The schedule is highly dependent on available funding from both BWS and City Department of Planning and Permitting (DPP) and therefore subject to change.



Watershed Planning Areas	BWS/DPP Funding Schedule	Target Dates for Submittal to CWRM for Plan Approval
Wai`anae, Ko`olauloa	2004	Submitted to CWRM in 2010
Ko`olaupoko	2008	In progress. 2011
North Shore	2011	2013
South Oahu: (Ewa, Central Oahu, Primary Urban Center, East Honolulu)	2014	2018

The multi-year funding schedule is proposed for the following reasons:

1. Plan complexity of the watershed approach to water resource management. The Framework recognizes that implementation of the requirements and recommendations will require phasing over several years and possibly over successive iterations as the Hawaii Water Plan is updated. (Statewide Framework Implementation Plan, Page 4-1)
2. BWS and DPP budgetary and staffing constraints.
3. To allow time for the completion of the State Agricultural Water Use and Development Plan for all agricultural zoned areas on Oahu.
4. Provide allowances for the lengthy plan approval process at the 36 neighborhood boards, City Council and Commission levels.

#### IV. Lack of clear priorities, schedule, and funding for implementation

At the September 23, 2010 Commission meeting, public testimony was submitted that expressed concern regarding the lack of clear priorities, schedule, and funding for implementation of the Koolauloa WMP. The implementation plan analyzed each proposed water development and watershed protection projects in relation to importance (to implementing agencies and the community), cost, and legal and institutional complexity. Based on these criteria, projects are prioritized and phased for implementation in general timeframes of short, mid and long term. The plan recognizes that jurisdiction over watershed protection and management objectives are spread across numerous federal, state, and county agencies. Some of the projects and strategies may be more appropriately undertaken by non-governmental organizations. This holistic approach to watershed planning includes strategies for implementation, both county and non-county, to facilitate programs working together over time. Plan implementation will depend on budgetary priorities, availability of grants and partnering efforts over the long term. The WMP provides the planning basis and rationale to seek future funding. Projects under the jurisdiction of BWS will be implemented in accordance with BWS' long-range Capital Improvement Program plan.

#### V. Chapter 343 – Environmental Assessment (EA) Compliance

Chapter 343 is not applicable to the proposed action. §HAR 11-200-5(d) provides

*For agency actions, chapter 343, HRS, exempts from applicability any feasibility or planning study for possible future programs which the agency has not approved, adopted, or funded. Nevertheless, if an agency is studying the feasibility of a proposal, it shall consider environmental factors and available alternatives and disclose these in any future assessment or subsequent statement. If, however, the planning and feasibility studies involve testing or other actions which may have significant impact on the environment, then an environmental assessment shall be prepared.*

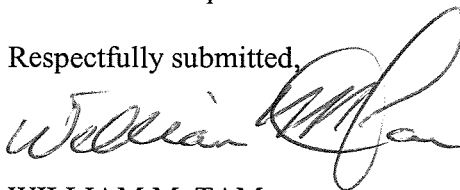
The watershed management plans are planning studies, which do not involve testing or other actions that will impact the environment. Therefore, HRS Chapter 343 is not applicable to this agency action.

RECOMMENDATION:

Staff recommends that the Commission:

1. Adopt the Koolauloa Watershed Management Plan as an update to the City and County of Honolulu's Water Use and Development Plan for incorporation into the Hawaii Water Plan.

Respectfully submitted,



WILLIAM M. TAM  
Deputy Director

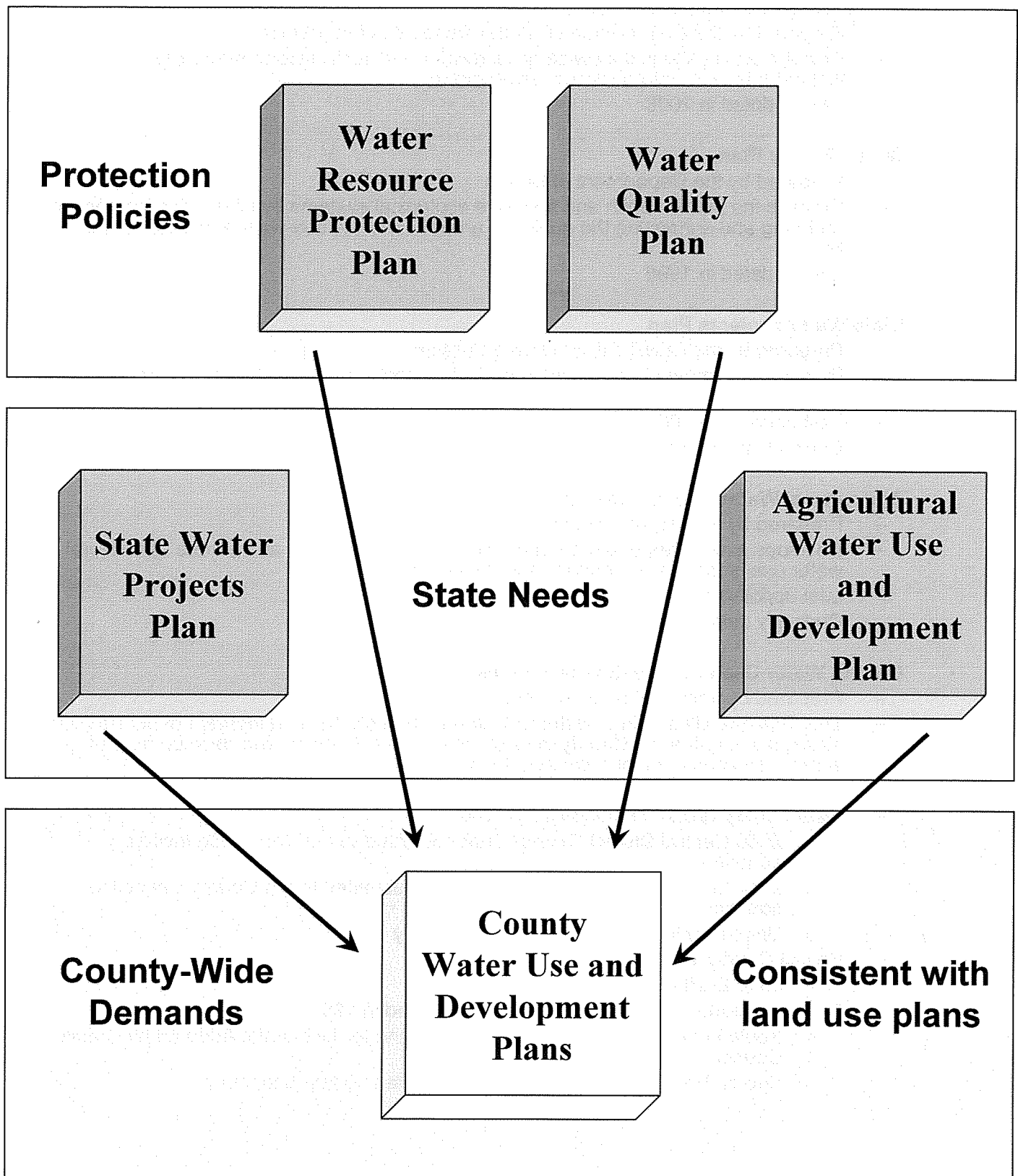
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| Exhibit (s): | 1 | Hawaii Water Plan Components   |
|              | 2 | Oahu Water Management Plan Framework and Scope of Work for the Waianae and Koolau Loa Watershed Management Plans |
|              | 3 | Community Consultation   |
|              | 4 | Summary of Objectives, Sub-Objectives, and Strategies  |
|              | 5 | Koolauloa Projected Water Demand and Supply Options for Most Likely Scenario                                     |
|              | 6 | Updated Oahu Water Management Plan Schedule for Regional Watershed Management Plans Dated February 2011          |

APPROVED FOR SUBMITTAL:



WILLIAM J. AILA, JR.  
Chairperson

# Hawaii Water Plan Components



# Hawaii Water Plan Components Status

- **Water Resource Protection Plan**
  - Prepared by the Commission on Water Resource Management
  - Protects and sustains statewide groundwater and surfacewater resources, watersheds, and natural stream environments.
  - Last updated in 2008
- **Water Quality Plan**
  - Prepared by the Department of Health
  - Protects the public health and sensitive ecological systems by preserving, protecting, restoring and enhancing the quality of ground- and surface-waters throughout the State
  - Last updated in 1990
- **State Water Projects Plan**
  - Prepared by the DLNR's Engineering Division
  - Provides a framework for planning and implementation of water development programs to meet projected water demands for State projects
  - Last updated in 2003
  - Currently being updated
- **Agricultural Water Use and Development Plan**
  - Prepared by the Department of Agriculture
  - Develops a long-range management plan that assess state and private agricultural water use, supply, and irrigation water systems
  - Last updated in 2004
  - Currently being updated
- **County Water Use and Development Plans**
  - Prepared by each of the four counties
  - Sets forth the allocation of water to land use through the development of policies and strategies to guide the County in its planning, management, and development of water resources to meet projected demands
  - Kauai County WUDP last updated in 1990
  - Maui County WUDP last updated in 1990
    - 2009 Central District Review Draft submitted to the County Council for adoption
    - 2011 Lanai Review Draft under review submitted to the County Council for adoption
    - Upcountry Maui District update underway
  - Hawaii County WUDP last updated in 1990
    - 2010 Draft Adopted by County Council
  - City and County of Honolulu WUDP last updated in 1990
    - Koolau Loa and Waianae Watershed Management Drafts Adopted by County Council
    - Koolau Poko Watershed Management Plan update underway



Oahu Water Management Plan Framework  
And Scope of Work for Wai`anae and Ko`olauloa  
Watershed Management Plans

Submitted to the State Commission on Water Resource Management  
in Compliance with the Statewide Framework for Updating the Hawaii  
Water Plan, Oahu County Water Use and Development Plan.

Attachment to BWS Transmittal Letter to CWRM, Dated February 20, 2004.

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### OWMP Framework Summary

The OWMP consists of policies and strategies, which guide the activities of the City and County of Honolulu and advises the State Commission on Water Resource Management (CWRM) in the areas of planning, management, water development and use and allocation of Oahu's natural water resources. The OWMP framework proposes regional plans entitled "watershed management plans" and shall be consistent with the following:

1. State Water Resource Protection Plan, State Water Quality Plan, State Water Projects Plan, State Agricultural Water Use and Development Plan and Department of Hawaiian Home Lands water plans as listed in Chapter 174C-31, Hawaii Water Plan, State Water Code.
2. The Statewide Framework for Updating the Hawaii Water Plan (Statewide Framework)
3. The General Plan for the City and County of Honolulu. The General Plan is a comprehensive statement of objectives and policies, which sets forth the long range aspirations of Oahu's residents and the strategies of actions to achieve them. It is the focal point of a comprehensive planning process that addresses physical, social, economic and environmental concerns affecting Oahu. This planning process serves as the coordinative means by which the City provides for the future growth of the metropolitan area of Honolulu. <http://www.honoluludpp.org/Planning/OahuGenPlan.asp>
4. 8 Development Plan (DP) and Sustainable Community Plan (SCP) land use planning regions of Oahu. Each community oriented land use plan is intended to help guide public policy, investment, and decision making over the next 20 years. Each plan responds to specific conditions and community values of each region. Ewa and Primary Urban Center are "development plan" areas where growth and supporting facilities will be directed and be the policy guide for development decisions and actions needed to support that growth. The remaining 6 land use areas are "sustainable communities" plans, which are envisioned as relatively stable regions in which public programs will focus on supporting existing populations. The following table lists the 8 land use planning reports with links.

Oahu's Land Use Planning Regions	Web Page Links to the Plans
Waianae	<a href="http://www.honoluludpp.org/Planning/DevSust_Waianae.asp">http://www.honoluludpp.org/Planning/DevSust_Waianae.asp</a>
Ko'olaupoko	<a href="http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp">http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp</a>
Ko'olaupoko	<a href="http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp">http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp</a>
North Shore	<a href="http://www.honoluludpp.org/Planning/DevSust_NorthShore.asp">http://www.honoluludpp.org/Planning/DevSust_NorthShore.asp</a>
Ewa	<a href="http://www.honoluludpp.org/Planning/DevSust_Ewa.asp">http://www.honoluludpp.org/Planning/DevSust_Ewa.asp</a>
Central Oahu	<a href="http://www.honoluludpp.org/Planning/DevSust_CentralOahu.asp">http://www.honoluludpp.org/Planning/DevSust_CentralOahu.asp</a>
East Honolulu	<a href="http://www.honoluludpp.org/Planning/DevSust_EastHonolulu.asp">http://www.honoluludpp.org/Planning/DevSust_EastHonolulu.asp</a>

Primary Urban Center	<a href="http://www.honoluludpp.org/Planning/DevSust_PrimaryUrbanCenter.asp">http://www.honoluludpp.org/Planning/DevSust_PrimaryUrbanCenter.asp</a>
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5. City and County of Honolulu Ordinance 90-62, Water Management establishing the Oahu Water Management Plan establishing water management policies and strategies “for water use and development within each development plan area.”
6. Annual Report to the Twenty-First Legislature 2001 Regular Session on Act 152, SLH 2000, Relating to Watershed Protection. The annual report set forth the development of a watershed master plan, including identifying protected watersheds areas, enhancement projects and an implementation plan.
7. Supreme Court Decision on Waiahole Ditch Contested Case applying the Public Trust Doctrine and the Precautionary Principle to water resource management.
8. BWS Sustainability Vision and Mission of “Water for Life” to enhance the quality of life of our community by providing world-class water services. Protecting the environment and supporting Oahu’s economy while involving the community achieve BWS goals of sustainable water supplies for future generations. BWS accomplishes these goals with our watershed protection and water conservation partnership programs and diversifying our water supplies, both natural and alternative technologies, such as recycled water, seawater desalination and ocean resource development.

#### Background:

The Commission in 1990 formally adopted the initial Hawaii Water Plan, prepared by various state and county agencies. Further updates in 1992 were deferred pending additional refinement of plan components. In 1994, the City and County of Honolulu began their initial revision to the Oahu Water Management Plan. The draft OWMP update was completed in January 1998 and is the most current reference document. However, it was not submitted for adoption because Oahu’s water situation was in a state of flux, with major changes in the agriculture industry, including the closing of the Oahu Sugar Company and the Waialua Sugar Company.

In 1999, the Honolulu Board of Water Supply (BWS) initiated the integrated resource planning process to update the Oahu Water Management Plan, Oahu’s County Water Use and Development Plan. The integrated islandwide water planning effort was met with significant opposition, which surfaced in our public participation process. After almost two years of effort, we did not move beyond the public participation process and so before we started the water planning stage, we decided to stop and re-evaluate our approach. We summarize the main lessons learned as follows:

1. It is important to have equal focus on resource protection, conservation and restoration as on water use and development. There needs to be a reassurance that our natural resources are protected and our water supplies are sustainable before planning on water use and development can successfully occur.



2. It is important to elevate the community's knowledge about water related issues so the interested community can actively participate in a community-based planning process. It is equally important that the planning document is written so that it is easily understood.
3. The islandwide integrated approach elevated community concerns on growth limits and regional water transport. The integrated approach is more complex on Oahu because approximately ¾'s of Oahu's water systems are interconnected. The communities needed assurance that there were sufficient water resources within their watersheds before islandwide regional water needs were discussed.

In February 2000, CWRM adopted a framework for updating the Hawaii Water Plan to provide focus and additional guidance to each agency responsible for updating specific plan components. CWRM recognized the complexities in addressing water resource planning and views the plans as "living documents which over several plan iterations will result in a truly comprehensive water plan" (Statewide Framework page 1-2)

In August 2000, the Hawaii Supreme Court's decision on the Waiahole Ditch Contested Case, and the remand hearings, provided additional guidance for water resources planning, like the precautionary principle. In addition, three public trust uses of water were identified; domestic use, instream use and water for traditional and cultural practices. Commercial and agricultural water uses are in a lower category.

In 2001, BWS broadened its mission to "Water for Life", which strives for sustainability of all water supplies and to enhance the quality of life of our community by providing world-class water services.

The 2000 Act 152 Watershed Protection required the development of a watershed protection master plan that identified priority watersheds and protection projects for implementation. Act 152 renewed BWS investment in watershed protection recognizing the importance of watersheds for the sustainability of our groundwater supplies and streams. To date, about \$1 million has been invested by BWS into Oahu's watersheds and aquifers. Noteworthy watershed protection projects are as follows:

- Ka'ala Bog Fencing to prevent feral animals from destroying the Mt. Ka'ala native habitat.
- Grant to the Oahu Invasive Species Committee to control invasive plant species within the Ko'olau watersheds
- Ala Wai Mauka Restoration Project for the Ko'olau Mountain Watershed Partnership
- BWS and Kamehameha Schools funded a USGS study to assess the hydrological and biological features and also funded the Punalu'u Agricultural Lands and Irrigation System Assessment to help set the in-stream flow standard for Punalu'u Stream.
- Waihe'e Valley Make a Difference Day invasive species removal
- Malama O Manoa "Kuleana Project" to change the residential practices of the Manoa Ahupua'a to increase awareness of water conservation and polluted runoff control.
- Watershed protection studies in Ala Wai, West Honolulu and Central Oahu.
- Ka'ala Farms and Mohala I Ka Wai educational awareness program
- Makaha Valley Restoration project
- Wai'anae and Ko'olauloa Watershed Management Plans

From 2001 to the present, several mountain and urban watershed partnerships have been established among BWS, agencies, organizations and community groups. Together, these partnerships have identified watershed protection projects and plans have been developed and funded. The following partnerships have been developed:

- Ko`olau Mountain Watershed Partnership
- Mohala I Ka Wai in Wai`anae
- Punalu`u Watershed Partnership
- Waihe`e Ahupua`a Initiative
- Ahupua`a Restoration Council of He`eia
- Malama O Manoa
- Wai`anae Kai Watershed Partnership
- University of Hawaii Manoa / BWS Water Conservation Partnership
- Hawaiian Electric Co. / BWS Energy and Water Conservation Partnership

#### Watershed Planning Approach:

The OWMP Framework proposes individual planning documents referred to as regional watershed management plans, which collectively will be the Oahu Water Management Plan. The regional watershed management plans will address the water needs, both present and future, for the 8 land use districts on Oahu. Rather than an islandwide approach brought down to each watershed, the watershed planning approach will start from the basic planning unit, each watershed or “ahupua`a” and expand it to the region or “moku”. It is important that this watershed management plan allow equal focus on resource protection, conservation and restoration as well as on water use and development. The watershed approach is supported by the following references:

- The planning regions will be consistent with and support each of the 8 DP/SCP land use planning regions established in the General Plan. The State Water Code, Chapter 174C-31(b)(2), requires that “Each water use and development plan shall be consistent with the respective county land use plans and policies, including general plan and zoning”.
- The Statewide Framework for Updating the Hawaii Water Plan, Page 3-26, Need for Flexibility, recognizes the need for appropriate flexibility in the county plans due to institutional and /or funding constraints, to encourage innovation as well as to accommodate unique and county-specific concerns.
- The Statewide Framework Page 3-19 also requires the preparation of “**regional plans** for water development including recommended and alternative plans, costs, adequacy of plans and relationship to water resource protection and quality plan.” (Emphasis added).

The watershed management plans will have the following key themes:

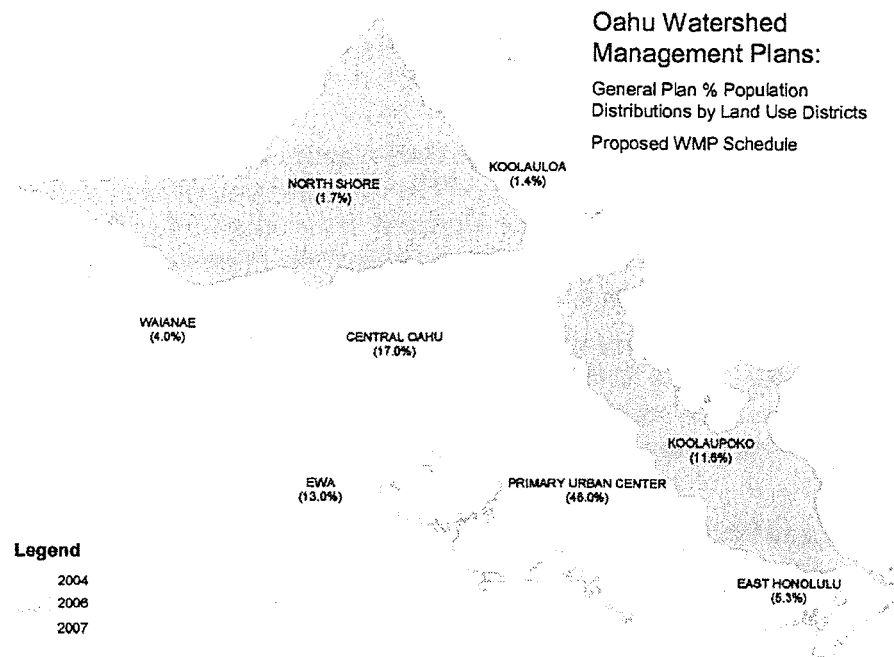
- Community-Based: In addition to public meetings, there will be many small group meetings with the community to educate, understand and apply the community’s thinking and values about water resources. A wide-range of community meetings will be conducted including regional organizations such as Mohala I Ka Wai, Malama Ohana and the Neighborhood

Boards, to local councils and associations, down to key individual meetings. The BWS watershed partnerships will be asked to provide representation for the community and key stakeholder groups.

- **Environmentally Holistic:** The watershed approach from mountains to the coral reefs recognizes the inter-dependence of water and land. The watershed management planning approach will not only address water use and development in the urban and agricultural zoned lands, but also describe protection strategies and enhancement projects for the forest reserves, conservation districts, streams and near-shore waters.
- **Action-Oriented:** The plan will describe specific watershed protection projects as well as natural and alternative water supply facilities that can be implemented by federal, state and city agencies and programs. The projects will be presented in a budgetary level format with information specific enough to support grant funding requests or an agency's capital improvement program.
- **Alignment with State and County Water and Land Use Policies** as stated above.
- **Reflects Ahupua`a Management Principles:** The watershed management plans will incorporate Ahupua`a principles in the plans. The community's help will be needed to identify their thinking and values about water. Living with Ahupua`a values and protocols is very important to culturally intact communities, like Wai`anae and Ko`olaupoko. Ahupua`a principles are not major factors in all districts, such as the urban metropolitan districts, however, these principles can still be used to guide water resource planning.

Proposed Schedule of Funding and Plan Approval:

The Oahu graphic below, shows the 8 land use areas on Oahu and the proposed funding schedule for the watershed management plans.



The following table lists the proposed funding schedules and anticipated target dates for submittal to CWRM for plan approval. The approval dates are based on an 18-month planning time frame and are only estimates and therefore subject to change.

Watershed Planning Areas	BWS Funding Schedule Fiscal Year	Target Dates for Submittal to CWRM for Plan Approval
Wai`anae, Ko`olauloa	FY 2004	1 <sup>st</sup> Qtr FY 2006
North Shore, Ko`olau-poko	FY 2006	2 <sup>nd</sup> Qtr FY 2007
South Oahu: (Ewa, Central Oahu, Primary Urban Center, East Honolulu)	FY 2007	2 <sup>nd</sup> Qtr FY 2008

\* BWS Fiscal Year is July 1 to June 30.

The four-year funding schedule is proposed due to the following reasons:

1. The Statewide Framework recognizes that implementation of the requirements and recommendations will need to be phased over the next several years and possibly over successive iterations of the updating process for the Hawaii Water Plan. (Statewide Framework Implementation Plan, Page 4-1)
2. BWS budgetary and staffing constraints.
3. As this watershed approach is new and unique, we are proposing an 18-month planning process to develop a baseline format and obtain the necessary approvals.

4. Wai`anae, Ko`olauloa, North Shore and Ko`olaupoko are designated as low growth, sustainable communities in the General Plan. The water demand projections for these areas show only marginal water demand increases through the planning horizon, currently 2025.
5. BWS is participating in active watershed partnerships in the Wai`anae and Ko`olauloa areas among others and these partnerships could assist in the public participation process.
6. South Oahu will be funded after the 4 rural districts for the following reasons:
  - To allow time for progress on the Section IV Framework Implementation Plan; Phase I Framework Adoption and Initial Updates to Hawaii Water Plan components, Phase II Development and Funding of New Framework Initiatives and Phase III Component Integration Phase of the Statewide Framework.
  - To allow time to complete the on-going products of the CWRM led Pearl Harbor Monitoring Group as part of the Milestone Framework for the Revised Pearl Harbor Sustainable Yields. Since 1998, BWS has funded over \$4 million for the construction of deep monitor wells throughout Oahu and have committed staffing resources for the monitoring of these wells on a quarterly basis. These wells will be essential in the groundwater monitoring and modeling efforts currently underway to increase our understanding of the groundwater supply in the Pearl Harbor and Honolulu aquifers.
  - To allow time to complete the Board of Water Supply's 3-dimensional groundwater model of the Honolulu aquifers.
  - To allow time to incorporate state projects water demands and agricultural water needs. We understand that the State Water Projects Plan was recently completed and the State Agricultural Water Use and Development plan is now underway.
  - The watershed management plans for South Oahu will be funded in the same fiscal year and may be combined into a single plan to more easily address the integration of water resources.

In calendar year 2000, South Oahu consumed about 78% of the islandwide municipal source pumpage of 154.6 mgd. We anticipate that the South Oahu watershed management plan(s) will fully utilize the IRP decision tools as described in the Statewide Framework for Updating the Hawaii Water Plan. The scope of work contemplated for the South Oahu regional watershed plan(s) will provide for compiling and developing water demand projections for domestic, commercial, industrial, agricultural, and nonpotable uses of municipal, state, federal and private water systems. It will also include assessment of environmental factors as part of the project objectives and evaluation criteria to be developed for the purpose of evaluating resource options and water management strategies.

#### Commitment for Agency Coordination:

As each watershed management plan moves forward and in addition to the public participation process, we anticipate several staff meetings with CWRM, City Department of Planning & Permitting and BWS to update our planning progress and obtain feedback and guidance. At key milestones, as coordinated with CWRM staff, we will present updates to the CWRM, tentatively mid-way through the planning process, after the public review draft is available, during plan approval and as otherwise requested by the CWRM. A schedule will be developed.

Each watershed management plan will be submitted for approval as separate documents, closely supporting each respective DP/SCP land use plan. At the completion of the first iteration of all planning regions, there will be a consolidating process to provide an islandwide perspective and to resolve any remaining inter-regional issues.

#### Proposed Scope of Work, Major Project Elements:

As each planning region is funded, their scopes of work will be submitted to the CWRM for review and approval. The proposed scopes of work for the Wai`anae and Ko`olauloa sustainable community plan areas are being submitted for CWRM review and approval (see attached). The draft scopes and planning approach were discussed with some of the community leaders and organizations in Wai`anae and Ko`olaupoko, and their feedback incorporated. The major project elements for the FY 2004 watershed management plans for Wai`anae and Ko`olauloa are:

1. Project Organization
2. Preliminary Watershed Analysis
3. Preliminary Stakeholders Consultations
4. Preliminary Watershed Management Strategies
5. 5-year Watershed Action Plan
6. Water Use and Development Plan
7. Draft Report
8. Final Report
9. Watershed Management Plan Approval

#### Summary of Current Water Distribution:

As part of the process of initiating the update of the OWMP and consistent with the guidelines set forth in the Statewide Framework for Updating the Hawaii Water Plan, we have compiled information on existing and projected water demands and sources of supply for the municipal system. BWS has evaluated the adequacy of the supply to meet the potable and nonpotable needs through ground water and recycled water sources. Water demand will be met with existing and funded source projects beyond the estimated 5-year planning period during the completion of all of the regional watershed management plans for Oahu.

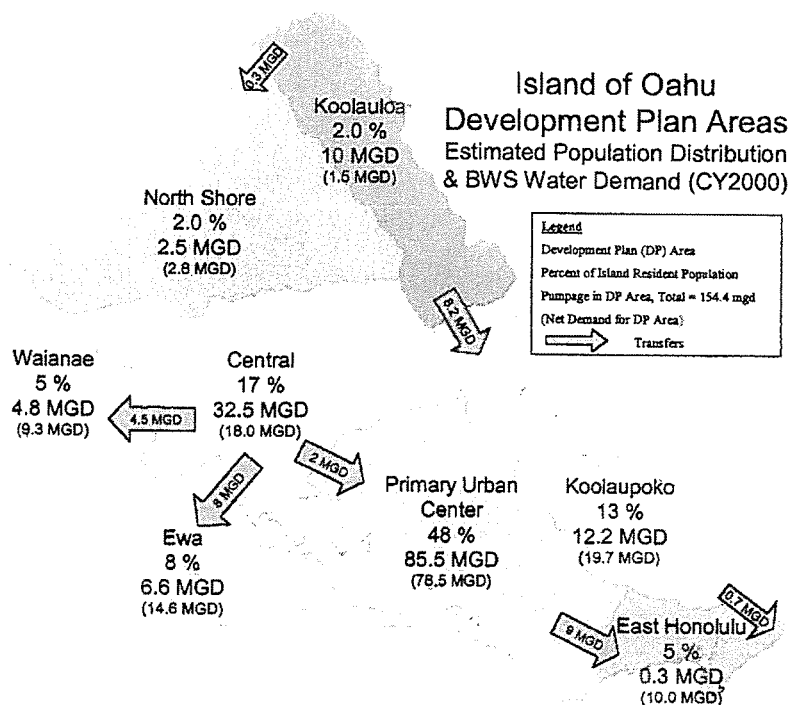
The sustainable communities of Wai`anae, North Shore, Ko`olauloa and Ko`olaupoko have essentially the same water demand throughout the planning period. The existing sources and infrastructure in these areas are adequate to provide potable water service through the planning horizon and therefore, additional integration of water supplies between these regions will be limited.

In South Oahu, the water supplies, both natural and alternative, will be fully integrated and described in a future scope of work that once funded in FY 2007, will be submitted to CWRM for their review and approval. The following summarizes the main land use and water planning highlights in South Oahu.

- The City's General Plan directs the majority of the growth to South Oahu.

- Based on the City's growth forecast evaluating population, visitors, housing and employment factors, we forecast an increase in potable water demand for Oahu averaging about 1.1 million gallons per day per year, most of which will occur in South Oahu. In 5 years the BWS system demand is expected to increase by about 5.5 mgd, from 156 mgd in 2003 to 161.5 in 2008. New sources in the Waipahu-Waiawa Water Management Area, as identified in the City DP and SCP land use plans, will be able to provide adequate water supply.
- In addition, in that time period, recycled water facilities in Ewa and Central Oahu will be expanded to continue to off-set additional groundwater development.
  - In 2000, BWS acquired and now operates the 12 mgd Honouliuli Water Recycling Facility supplying irrigation and industrial process water for Ewa.
  - BWS has also funded the design of a delivery system to utilize approximately 3.0 mgd of Wahiawa recycled water in Central Oahu.
- The Kalaeloa seawater desalination plant is currently under design and will bring an additional 5.0 mgd of potable water supply to the second city of Kapolei.

For your information, a summary of Oahu's estimated population distribution based on the 2000 census, BWS potable water demand in calendar year 2000 and water distribution is provided among the 8 land use regions. This is essentially the base case of existing water demand and distribution in the BWS system that will be referenced in establishing future watershed management plans scenarios. As we have stated above, the future water demand and distribution in the Waianae, North Shore and Windward regions will not change significantly.



## **KOOLAULOA WATERSHED MANAGEMENT PLAN COMMUNITY CONSULTATION**

### **ONE-ON-ONE DIALOGUES**

Individuals and Groups listed in Table 2-10	2004-2005
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### **AGENCY MEETINGS**

Meeting #1	3/5/2005
Meeting #2	11/1/2006

### **WORKING GROUP MEETINGS**

Meeting #1	5/12/2005
Meeting #2	6/9/2005
Meeting #3	7/14/2005
Meeting #4	8/13/2005
Meeting #5	11/19/2005
Meeting #6	10/21/2006

### **NEIGHBORHOOD BOARD**

Neighborhood Board updates provided between 2005-2010 by BWS representative on the Board

Endorsement	2007
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### **UPDATES**

BWS Board of Directors	4/27/2009
CWRM	9/27/2005
CWRM	12/16/2005
CWRM	11/15/2006
CWRM	8/28/2008
CWRM	11/15/2006

### **APPROVALS**

City Council - 1st Reading	2/24/2010
City Council Planning Committee - 2nd Reading	3/4/2010
City Council Planning Committee - deferral	4/8/2010
City Council Adoption by Ordinance	8/18/2010
CWRM - Public Hearing	6/23/2010
CWRM - Commission Meeting	9/23/2010



# KO'OLAU LOA WATERSHED MANAGEMENT PLAN

## CHAPTER 4: OBJECTIVES, SUB-OBJECTIVES AND STRATEGIES

**Table 4.1 Summary Table for Objective #1: Promote Sustainable Watersheds**

Sub-Objectives / Strategies	Projects
<b>1.1 Strive to enhance and protect natural resources including land, streams and nearshore waters ecosystems</b>	
1.1.1 Ensure that mountain watersheds and other conservation zoned lands are actively protected and healthy	<ul style="list-style-type: none"> <li>• Watershed Partnerships</li> <li>• Conservation District Boundary Review</li> <li>• Wildfire Management Plan</li> </ul>
1.1.2 Manage agricultural lands for watershed health in addition to income generation	<ul style="list-style-type: none"> <li>• Pollution Prevention / Low Impact Development</li> <li>• Crop Water Demand</li> </ul>
1.1.3 Ensure that the additional urban growth is clustered within the Sustainable Communities Plan Rural Community Boundary and is designed for minimal impact on the environment	<ul style="list-style-type: none"> <li>• Pollution Prevention / Low Impact Development</li> <li>• Stream Conservation Buffers</li> <li>• Cesspool Inventory / Greywater Reuse</li> </ul>
<b>1.2 Strive to set measurable instream flow standards</b>	
1.2.1 Develop measurable instream flow standards for priority streams in Ko'olau Loa	<ul style="list-style-type: none"> <li>• Measurable Instream Flow Standards</li> </ul>
<b>1.3 Collaborate with responsible agencies to identify and implement environmentally-friendly measures to alleviate flooding issues and reduce pollution caused by runoff</b>	
1.3.1 Plan and implement flood control measures	<ul style="list-style-type: none"> <li>• Flood Control / Stormwater Management</li> <li>• Flood Channel Redesign</li> </ul>
1.3.2 Improve management of streams and stream banks	<ul style="list-style-type: none"> <li>• Stream Clearing and Management</li> </ul>
1.3.3 Restore muliwai and wetlands for flood protection	<ul style="list-style-type: none"> <li>• Muliwai / Wetland Restoration</li> </ul>
<b>1.4 Promote initiatives that preserve species and habitat biodiversity, particularly native species</b>	
1.4.1 Protect native species by reducing the threats of invasive plant species	<ul style="list-style-type: none"> <li>• Invasive Species Assessment / Control</li> </ul>
1.4.2 Protect native species by reducing the effects of feral pigs	<ul style="list-style-type: none"> <li>• Feral Pig Management Plan</li> </ul>
<b>1.5 Ensure the export of water from Ko'olau Loa will not be detrimental to Ko'olau Loa</b>	
1.5.1 Increase water conservation in Ko'olau Poko	<ul style="list-style-type: none"> <li>• Conservation Measures</li> <li>• Ag Water Loss Minimization</li> <li>• Increased Recycled Water</li> </ul>

# KO'OLAU LOA WATERSHED MANAGEMENT PLAN

## CHAPTER 4: OBJECTIVES, SUB-OBJECTIVES AND STRATEGIES

Table 4.2 Summary Table for Objective #2: Protect and Enhance Water Quality and Quantity

<b>OBJECTIVE #2 – PROTECT AND ENHANCE WATER QUALITY AND QUANTITY</b>	
<b>Sub-Objectives / Strategies</b>	<b>Projects</b>
<b>2.1 Maintain and improve the water quality and quantity of groundwater</b>	
2.1.1 Implement <i>source water protection and security</i> measures	<ul style="list-style-type: none"> <li>• Groundwater Source Protection</li> </ul>
2.1.2 Maintain aquifer integrity	<ul style="list-style-type: none"> <li>• Drought Mitigation Strategies</li> <li>• Punalu'u Pumpage Optimization</li> </ul>
2.1.3 Continue to provide <i>high quality drinking water supply</i> that meets or exceeds Safe Drinking Water Standards	<ul style="list-style-type: none"> <li>• Various ongoing BWS initiatives, including regular monitoring and reporting</li> </ul>
2.1.4 Periodically review the sustainable yield estimate	<ul style="list-style-type: none"> <li>• Sustainable Yield Estimate</li> </ul>
<b>2.2 Maintain and improve the water quality and quantity of surface waters</b>	
2.2.1 Implement measures that improve the quality of surface waters that come from urban and agricultural land uses	<ul style="list-style-type: none"> <li>• Pollution Prevention / Low Impact Development</li> <li>• Stream Conservation Buffers</li> <li>• Cesspool Inventory/Greywater Reuse</li> </ul>
2.2.2 Monitor surface water quality	<ul style="list-style-type: none"> <li>• Stream Water Quality Testing</li> </ul>
<b>2.3 Maintain and improve the water quality of nearshore waters</b>	
2.3.1 Improve the ability of natural systems to capture and retain surface water	<ul style="list-style-type: none"> <li>• Watershed Partnerships</li> <li>• Invasive Species Assessments / Control</li> <li>• Feral Pig Management</li> <li>• Muliwai / Wetland Restoration</li> </ul>
2.3.2 Monitor nearshore water quality	<ul style="list-style-type: none"> <li>• Nearshore Water Monitoring</li> </ul>

## KO'OLAU LOA WATERSHED MANAGEMENT PLAN

### CHAPTER 4: OBJECTIVES, SUB-OBJECTIVES AND STRATEGIES

**Table 4.3 Summary Table for Objective #3: Protect Native Hawaiian Rights and Traditional and Customary Practices**

Sub-Objectives / Strategies	Projects
<b>3.1 Plan for the enhancement of Native Hawaiian water rights and cultural and traditional uses</b>	
3.1.1 Use surface water more effectively and efficiently so as to minimize leakage, evaporation and waste	<ul style="list-style-type: none"> <li>• Agricultural Water Loss Minimization</li> </ul>
3.1.2 Develop new groundwater sources that do not impact surface waters	<ul style="list-style-type: none"> <li>• Measurable Instream Flow Standards</li> </ul>
3.1.3 Promote and preserve Native Hawaiian practices in the watershed	<ul style="list-style-type: none"> <li>• Lo'i Kalo Expansion</li> <li>• Watershed Oral History Studies</li> <li>• Cultural Educational Programs</li> <li>• Fishpond (Loko I'a) Restoration</li> </ul>
<b>3.2 Consult with Native Hawaiian agencies/community on water-related issues</b>	
3.2.1 Prior to constructing projects in culturally sensitive areas, consult with the Native Hawaiian community	<ul style="list-style-type: none"> <li>• Cultural Monitoring Program</li> </ul>
3.2.2 Use the guidance from the Kapa'akai (2000) court decision on Native Hawaiian consultation on providing for the ability to exercise Native Hawaiian traditional and customary rights	<ul style="list-style-type: none"> <li>• Various agencies with land use decision-making authority to review projects for Native Hawaiian issues</li> </ul>

## KO'OLAU LOA WATERSHED MANAGEMENT PLAN

### CHAPTER 4: OBJECTIVES, SUB-OBJECTIVES AND STRATEGIES

**Table 4.4 Summary Table for Objective #4: Facilitate Public Participation, Education, and Project Implementation**

<b>OBJECTIVE #4 – FACILITATE PUBLIC PARTICIPATION, EDUCATION AND PROJECT IMPLEMENTATION</b>	
<b>Sub-Objectives / Strategies</b>	<b>Projects</b>
<b>4.1 <i>Implement watershed management projects and programs, through a combination of agency initiatives, watershed partnerships and community-based implementation entities</i></b>	
4.1.1 <i>Support the existing and future watershed partnerships in Ko'olau Loa</i>	<ul style="list-style-type: none"> <li>• Watershed Partnerships</li> </ul>
<b>4.2 <i>Develop watershed protection curriculum and programs to educate future generations and make curriculum available to area schools and organizations</i></b>	
4.2.1 <i>Continue BWS educational programs in schools and develop a curriculum that promotes the health of our watersheds</i>	<ul style="list-style-type: none"> <li>• Water and Watershed Education</li> </ul>
<b>4.3 <i>Empower residents to facilitate public participation in water resources planning and management</i></b>	
4.3.1 <i>Provide opportunities for residents to participate in resource planning through new or existing organizations</i>	<ul style="list-style-type: none"> <li>• Watershed Partnerships</li> </ul>
<b>4.4 <i>Provide education on watershed issues and protection and water conservation measures to the general public</i></b>	
4.4.1 <i>Support creation of an implementation entity through an existing or new organization for Ko'olau Loa</i>	<ul style="list-style-type: none"> <li>• Ko'olau Loa Implementation Entity</li> </ul>
<b>4.5 <i>Obtain funding to implement the plan's projects and programs; funding types may include dedicated sources, grants and appropriations</i></b>	
4.5.1 <i>Identify sources of governmental funding and non-profit funding sources available for watershed management project implementation</i>	<ul style="list-style-type: none"> <li>• Grant Funding</li> </ul>

# KO'OLAU LOA WATERSHED MANAGEMENT PLAN

## CHAPTER 4: OBJECTIVES, SUB-OBJECTIVES AND STRATEGIES

**Table 4.5 Summary Table for Objective #5: Meet Water Demands at Reasonable Costs**

<b>OBJECTIVE #5 – MEET WATER DEMANDS AT A REASONABLE COST</b>	
<b>Sub-Objectives / Strategies</b>	<b>Projects</b>
<b>5.1 Provide water at a reasonable cost to the community in a way that provides for the long term health of the watershed</b>	
5.1.1 Make the best use of existing supplies before developing new water sources	<ul style="list-style-type: none"> <li>• Punalu'u Pumpage Optimization</li> <li>• Various initiatives to optimize use of existing sources</li> </ul>
5.1.2 When new sources are needed, balance least cost options with environmentally, culturally, and socially acceptable options	<ul style="list-style-type: none"> <li>• Potable Well Development</li> </ul>
<b>5.2 Efficiently meet water demands and match quality (i.e. potable, brackish, recycled) with use (drinking, irrigation, etc.)</b>	
5.2.1 Increase water conservation measures	<ul style="list-style-type: none"> <li>• Conservation Measures</li> <li>• Agriculture Water Loss Minimization</li> </ul>
5.2.2 Develop and use recycled water to meet non-potable demands, where feasible	<ul style="list-style-type: none"> <li>• Increased Recycled Water</li> <li>• Cesspool Inventory / Greywater Reuse</li> </ul>
5.2.3 Use surface water within current and future instream flow standards for non-potable demand	<ul style="list-style-type: none"> <li>• Surface Water Use</li> </ul>
5.2.4 Develop new agricultural / aquaculture wells for non-potable demand	<ul style="list-style-type: none"> <li>• Agriculture (Non-Potable) Well Development</li> </ul>
<b>5.3 Maintain and improve BWS system reliability</b>	
5.3.1 Continue to provide high quality drinking water supply that meets or exceeds Safe Drinking Water Standards	<ul style="list-style-type: none"> <li>• Groundwater Source Protection</li> <li>• Various ongoing BWS initiatives, including regular monitoring and reporting</li> </ul>
5.3.2 Continue BWS' ongoing main replacement program and other system upgrades	<ul style="list-style-type: none"> <li>• Refer to BWS Capital Program (Appendix F)</li> </ul>
5.3.3 Optimize system operations	<ul style="list-style-type: none"> <li>• Punalu'u Pumpage Optimization</li> <li>• Various ongoing BWS system management measures including leak detection and back-up supplies</li> </ul>
5.3.4 Implement security measures	<ul style="list-style-type: none"> <li>• Various ongoing BWS facilities security initiatives</li> </ul>

# KO'OLAU LOA WATERSHED MANAGEMENT PLAN

## CHAPTER 6: IMPLEMENTATION

**Table 6.13 Ko'olau Loa Mid/Policy Demand Scenario: Projected Water Demand and Supply Options**

DEMAND (mgd)	2000	2005	2010	2015	2020	2025	2030
BWS Potable	1.46	1.57	1.86	1.89	1.92	1.96	2.15
BWS Potable export to Ko'olau Poko & North Shore	8.60	8.60	8.60	8.60	8.60	8.60	8.60
LWC Potable	0.95	1.15	1.32	1.39	1.46	1.52	1.59
<b>Total Potable Demand</b>	<b>11.01</b>	<b>11.32</b>	<b>11.78</b>	<b>11.87</b>	<b>11.97</b>	<b>12.08</b>	<b>12.34</b>
Non-Potable Agriculture	13.25	13.79	14.37	14.99	15.68	16.42	17.22
Non-Potable Other	1.88	2.28	2.39	2.40	2.67	3.02	3.37
<b>Total Non-Potable Demand</b>	<b>15.13</b>	<b>16.07</b>	<b>16.75</b>	<b>17.39</b>	<b>18.34</b>	<b>19.44</b>	<b>20.59</b>
<b>TOTAL DEMAND</b>	<b>26.14</b>	<b>27.39</b>	<b>28.53</b>	<b>29.26</b>	<b>30.32</b>	<b>31.52</b>	<b>32.93</b>

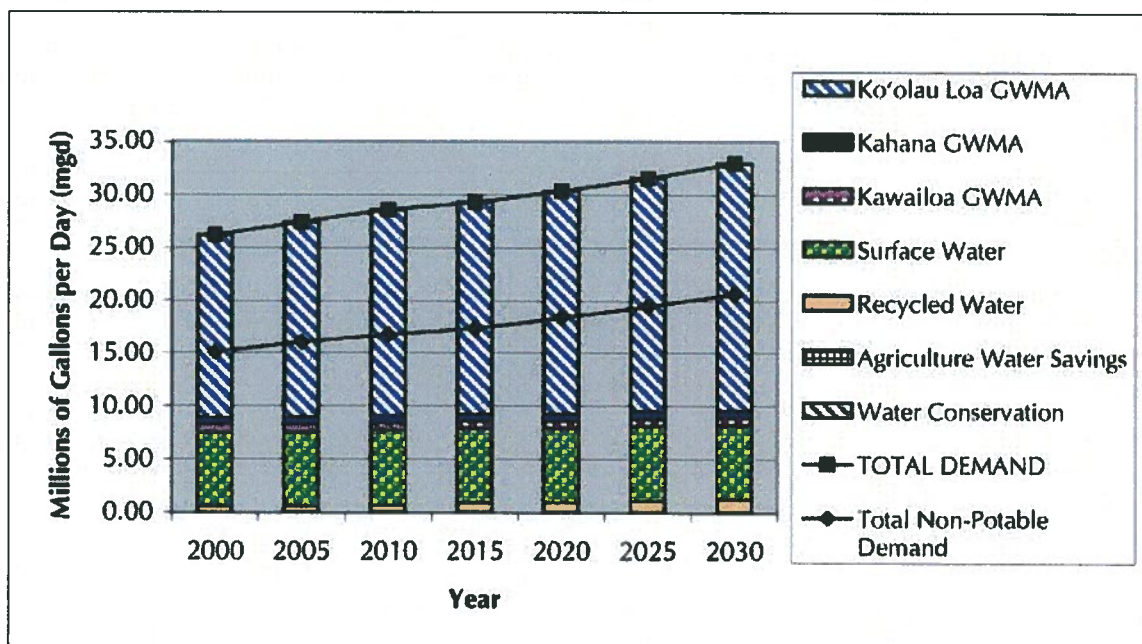
  

SUPPLY (mgd)	2000	2005	2010	2015	2020	2025	2030
Ko'olau Loa GWMA <sup>1</sup>	17.24	18.47	19.49	20.01	21.06	22.05	23.36
Kahana GWMA <sup>2</sup>	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Kawailoa GWMA	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Surface Water <sup>3</sup>	6.98	6.98	6.98	6.98	6.98	6.98	6.98
Recycled Water	0.56	0.57	0.68	0.89	0.90	1.10	1.20
Agriculture Water Savings	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Water Conservation	0.00	0.01	0.02	0.02	0.02	0.03	0.03
<b>TOTAL SUPPLY</b>	<b>26.14</b>	<b>27.39</b>	<b>28.53</b>	<b>29.26</b>	<b>30.32</b>	<b>31.52</b>	<b>32.93</b>

<sup>1</sup> Sustainable yield for Ko'olau Loa GWMA is 36 mgd.

<sup>2</sup> Sustainable yield for Kahana GWMA is 15 mgd.

<sup>3</sup> Surface Water is assumed to be the existing water use pending measurable instream flow standards.



**Figure 6.3 Ko'olau Loa Mid/Policy Demand Scenario: Projected Water Demand and Supply Options**



Updated Oahu Water Management Plan Schedule for  
Regional Watershed Management Plans

Dated February 2011

Submitted to the State Commission on Water Resource Management  
in Compliance with the Statewide Framework for Updating the Hawaii  
Water Plan, Oahu County Water Use and Development Plan.

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## **Oahu Water Management Plan Framework**

The Board of Water Supply, City and County of Honolulu presented the following Oahu Water Management Plan (OWMP) framework to the Commission and it was subsequently approved on March 17, 2004.

The Oahu Water Management Plan (OWMP) is the County Water Use and Development Plan for the City and County of Honolulu in accordance with the Hawaii Water Plan requirements of Chapter 174C-31, State Water Code. The OWMP was enacted by Ordinance No. 90-62 and codified as Chapter 30, Articles 1, 2 and 3, Revised Ordinances of Honolulu (ROH), 1990, as amended. The OWMP consists of policies and strategies, which guide the activities of the City and County of Honolulu and advises the State Commission on Water Resource Management (CWRM) in the areas of planning, management, water development and use and allocation of Oahu's natural water resources.

The OWMP will ultimately include 8-regional plans entitled Watershed Management Plans for each of the 8-land use districts on Oahu created in the General Plan of the City and County of Honolulu. The 8 regional watershed management plans along with an islandwide overview within each regional plan and together with the islandwide water management policies and strategies in Article 2 of ROH, Chapter 30, will form the updated Oahu Water Management Plan.

The OWMP shall be consistent with the following:

1. Key statutory requirements of the Chapter 174C, State Water Code
  - a. The Water Resource Protection Plan and Water Quality Plan;
  - b. County land use plans and policies; and
  - c. State land use classification and policies.
  - d. The status of water and related land development including an inventory of existing water uses;
  - e. Future land uses and related water needs;
  - f. Regional plans for water developments including recommended and alternative plans, costs, and adequacy of plans;
  - g. Consultation and careful evaluation of recommendations of concerned Federal, State and County agencies;
  - h. Incorporation of the current and foreseeable development and use needs of the Department of Hawaiian Home Lands; and
  - i. Maintain consistency with its zoning and land use policies updates and modifications.
2. Key elements of the statewide framework pertaining to the update of the County Water Use and Development Plans
  - a. Submission of a County-Specific WUDP Project Description for review and approval by the Commission. The Project Description should include:
    - i. Identification of specific issues relating to land use, water use and resource development, and the relative priority of the issues to be addressed in the WUDP update;
    - ii. An outline of the County's plan for establishment of planning objectives and evaluation criteria;

- iii. A description of its public/stakeholder participation and public information program;
  - iv. A description of its plans for identification of: water demand forecasts (and the consideration of future uncertainties) within the aquifer systems identified by the Commission, conservation and demand-side management programs, source development options and any potential impacts to the resource, and the development and integration of resource development strategies;
  - v. A schedule for the County's updating of the WUDP, which shall:
  - vi. Outline the different stages and activities of the County's planning effort;
  - vii. Indicate the approximate times and anticipated duration for public participation activities;
  - viii. Indicate the approximate timeframe for County approval of the WUDP and submission of the WUDP to the Commission for adoption;
  - ix. A description on how information from the State Water Projects Plan and the Agricultural Water Use and Development Plan will be integrated and used in updating the WUDP.
- b. Each County shall brief the Commission and its staff regarding any planned updates of the County WUDP; and
  - c. Conduct periodic milestone briefings to the Commission during the WUDP updating process.
3. The General Plan for the City and County of Honolulu. The General Plan is a comprehensive statement of objectives and policies, which sets forth the long range aspirations of Oahu's residents and the strategies of actions to achieve them. It is the focal point of a comprehensive planning process that addresses physical, social, economic and environmental concerns affecting Oahu. This planning process serves as the coordinative means by which the City provides for the future growth of the metropolitan area of Honolulu. <http://www.honoluludpp.org/Planning/OahuGenPlan.asp>
4. 8 Development Plans (DP) and Sustainable Communities Plans (SCP) land use planning regions of Oahu. Each community oriented land use plan is intended to help guide public policy, investment, and decision making over the next 20 years. Each plan responds to specific conditions and community values of each region. Ewa and Primary Urban Center are "development plan" areas where growth and supporting facilities will be directed and be the policy guide for development decisions and actions needed to support that growth. The remaining 6 land use areas are "sustainable communities" plans, which are envisioned as relatively stable regions in which public programs will focus on supporting existing populations. The following table lists the 8 land use plan reports with links.

<b>Oahu's Land Use Planning Regions</b>	<b>Web Page Links to the Development &amp; Sustainable Communities Plans</b>
Waianae	<a href="http://www.honoluludpp.org/Planning/DevSust_Waianae.asp">http://www.honoluludpp.org/Planning/DevSust_Waianae.asp</a>
Ko`olauloa	<a href="http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp">http://www.honoluludpp.org/Planning/DevSust_Koolauloa.asp</a>
Ko`olaupoko	<a href="http://www.honoluludpp.org/Planning/DevSust_Koolaupoko.asp">http://www.honoluludpp.org/Planning/DevSust_Koolaupoko.asp</a>
North Shore	<a href="http://www.honoluludpp.org/Planning/DevSust_NorthShore.asp">http://www.honoluludpp.org/Planning/DevSust_NorthShore.asp</a>

Ewa	<a href="http://www.honoluludpp.org/Planning/DevSust_Ewa.asp">http://www.honoluludpp.org/Planning/DevSust_Ewa.asp</a>
Central Oahu	<a href="http://www.honoluludpp.org/Planning/DevSust_CentralOahu.asp">http://www.honoluludpp.org/Planning/DevSust_CentralOahu.asp</a>
East Honolulu	<a href="http://www.honoluludpp.org/Planning/DevSust_EastHonolulu.asp">http://www.honoluludpp.org/Planning/DevSust_EastHonolulu.asp</a>
Primary Urban Center	<a href="http://www.honoluludpp.org/Planning/DevSust_PrimaryUrbanCenter.asp">http://www.honoluludpp.org/Planning/DevSust_PrimaryUrbanCenter.asp</a>

5. Chapter 30 Revised Ordinances of Honolulu, Water Management, Articles 1, 2 and 3, establishing the Oahu Water Management Plan and consisting of water management policies and strategies “for water use and development within each development plan area.”
6. Annual Report to the Twenty-First Legislature 2001 Regular Session on Act 152, SLH 2000, Relating to Watershed Protection. The annual report set forth the development of a watershed master plan, including identifying protected watersheds areas, enhancement projects and an implementation plan.
7. Supreme Court Decision on Waiahole Ditch Contested Case applying the Public Trust Doctrine and the Precautionary Principle to water resource management.
8. BWS mission of “Water for Life, Providing Safe and Dependable Water”. Protecting the environment and supporting Oahu’s economy while involving the community achieve BWS goals of sustainable water supplies for future generations. BWS accomplishes these goals with our watershed protection and water conservation programs and the sustainable development of natural and alternative water supplies, such as recycled water and brackish and seawater desalination.

### **Watershed Planning Approach:**

The OWMP Framework will consist of 8 regional watershed management plans each with an islandwide overview section and together with the islandwide water management policies and strategies in Article 2 of ROH, Chapter 30, will form the updated Oahu Water Management Plan. The regional watershed management plans will provide equal focus on resource protection, conservation and restoration as well as on water use and development. The watershed approach is supported by the following references:

- The planning regions will be consistent with and support each of the 8 DP/SCP land use planning regions established in the General Plan. The State Water Code, Chapter 174C-31(b)(2), requires that “Each water use and development plan shall be consistent with the respective county land use plans and policies, including general plan and zoning”.
- The Statewide Framework for Updating the Hawaii Water Plan, Page 3-26, Need for Flexibility, recognizes the need for appropriate flexibility in the county plans due to institutional and /or funding constraints, to encourage innovation as well as to accommodate unique and county-specific concerns.

- The Statewide Framework Page 3-19 also requires the preparation of “**regional plans** for water development including recommended and alternative plans, costs, adequacy of plans and relationship to water resource protection and quality plan.” (Emphasis added).

The watershed management plans will have the following key themes:

- **Community-Based:** In addition to public meetings, there will be many small group meetings with the community to educate, understand and apply the community’s thinking and values about water resources. A wide-range of community, landowner, agency and other key stakeholder meetings will be conducted culminating with a request for Neighborhood Board endorsement of each respective regional plan.
- **Environmentally Holistic:** The watershed approach from mountains to the coral reefs recognizes the inter-dependence of water and land. The watershed management planning approach will not only address water use and development in the urban and agricultural zoned lands, but also describe protection strategies and enhancement projects for the forest reserves, conservation districts, streams and near-shore waters. This is consistent with the various sections of the State Water Resources Protection Plan.
- **Action-Oriented:** The plan will describe specific watershed protection projects and strategies as well as natural and alternative water supply projects that can be implemented by federal, state and city agencies as well as landowners and organizations.
- **Alignment with State and County Water and Land Use Policies.**
- **Reflects Ahupua`a Management Principles:** The watershed management plans will incorporate Ahupua`a principles (environment, economic, social and cultural) in the plans. These principles will be used to guide water resource planning tailored to each respective community.

## **Proposed Schedule of Funding and Plan Approval:**

The following table lists the 8 land use districts on Oahu with the revised funding schedules and revised target dates for submittal to the Commission for plan approval as of February 2011. The revised dates are estimates, based on best available information from recent experience in compiling a comprehensive watershed based plan with a significant public participation component and an extensive plan endorsement/approval process with the neighborhood boards, City Council and Commission. The schedule is highly dependent on available funding from both BWS and City DPP and therefore subject to change.

<b>Watershed Planning Areas</b>	<b>BWS/DPP Funding Schedule</b>	<b>Target Dates for Submittal to CWRM for Plan Approval</b>
Wai`anae, Ko`olaupoko	2004	Submitted to CWRM in 2010
Ko`olaupoko	2008	In progress. 2011
North Shore	2011	2013
South Oahu: (Ewa, Central Oahu, Primary Urban Center, East Honolulu)	2014	2018

The multi-year funding schedule is proposed due to the following reasons:

1. Plan complexity of the watershed approach to water resource management. The Statewide Framework recognizes that implementation of the requirements and recommendations will need to be phased over the next several years and possibly over successive iterations of the updating process for the Hawaii Water Plan. (Statewide Framework Implementation Plan, Page 4-1)
2. BWS and DPP budgetary and staffing constraints.
3. To allow time for the completion of the State Agricultural Water Use and Development Plan for all agricultural zoned areas on Oahu.
4. Provide allowances for the lengthy plan approval process at the 36 neighborhood boards, City Council and Commission levels.

## **Plan Approval:**

Each watershed management plan will be submitted for approval as separate documents, supporting each respective DP/SCP land use plan, State land use plans and the statutory and statewide framework requirements. Each regional plan will seek the endorsement of the respective neighborhood boards before being submitted to the Honolulu City Council for adoption as an amendment to Chapter 30, ROH, Water Management. The adopted plans will then be submitted to the Commission for final adoption. Public hearings will be conducted at both the City Council and Commission levels concurrently as to ensure issues, comments and concerns are addressed. The islandwide overview section within each regional plan will provide the islandwide perspective and resolve inter-regional issues into a cohesive OWMP framework. A consolidating process at the end of the first complete iteration of all 8 plans is therefore not expected to be necessary.

## **Major Plan Elements:**

As each planning region is funded, their scopes of work will be submitted to the CWRM for review and approval. The major project elements for the regional watershed management plans are:

### **Watershed Management Plan Goal:**

To formulate an environmentally holistic, community-based and economically viable plan that will provide a balance between:

- The Preservation and Management of Oahu’s Watersheds
- Sustainable ground and surface water use & development to serve present users and future generations

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